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# **Suisun Marsh Monitoring Program Channel Water Salinity Report**

Reporting Period: January 2003

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## **SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT**

The California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. This requirement is based on SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions. Channel water salinity conditions in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance".

The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

<b>Station Identification</b>	<b>Station Name</b>	<b>General Location</b>	<b>Status</b>
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

\*Throughout this report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

<b>Station Identification</b>	<b>Station Name</b>	<b>General Location</b>	<b>Status</b>
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

## **Monitoring Results**

### **Channel Water Salinity Compliance**

State Water Resources Control Board channel water salinity standards for the Suisun Marsh were met at all five compliance stations during January 2003 (Table 1). Compliance with channel water salinity standards was determined for each compliance station by comparing January mean high-tide specific conductance (SC) with respective standards. The standard for all the compliance stations ( i.e. C-2, S-64, S-49, S-42, S-21) was **12.5** mS/cm during January 2003. Table 1 lists monthly mean high-tide SC at the compliance stations.

The progressive daily mean SC for each station is used to track salinity conditions during each month (Figures 1). The progressive mean is calculated for each compliance station. The progressive daily mean (PDM) is the mean of daily average high-tide SC of the month. The mathematical equation is shown below. New progressive mean calculations begin at the start of each calendar month.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

### **Delta Outflow**

High Delta outflow occurred in January 2003 (Figure 3). For the most part, Delta outflow was above 40,000 cfs, except the second week of January. Delta Outflow peaked at about 85,000 cfs on January 18, 2003. The monthly mean Net Delta Outflow Index (NDOI) for January is listed below:

<b>Month</b>	<b>Mean NDOI (cubic feet per second)</b>
January	49,500

The NDOI is the estimated average daily rate of outflow from the Delta.

## Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during January 2003 is listed below:

Month	Total Rainfall (inches)
January	2.42

## Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during January 2003 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
January 1-31	3 gates open	Installed	Closed

All three gates were held open due to low water quality levels in the marsh as a result of increased precipitation and very high runoffs. The flashboards remained installed in the event that gate operation is needed to control salinity in the coming control months.

## Discussion

### Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

## **Observations and Trends**

### **Conditions during the Reporting Period**

Salinity levels at all compliance stations were well below 3 mS/cm throughout January (Figure 1). For the two monitoring stations, recorded salinity levels ranged between 3 mS/cm and 5 mS/cm (Figure 2). Continued increase precipitation resulting in high runoffs kept salinity level throughout the entire marsh well below the standard of 12.5 mS/cm.

Channel water salinity conditions in the Marsh were mainly driven by precipitation in January 2003. SMSCG operations ceased on December 31, 2002, so gate operations was not a contributing factor to lower salinity levels in January. Compared to December 2002 monthly outflow (i.e. 25, 000 cfs), January 2003 monthly outflow (i.e. 49,000 cfs) almost doubled that amount. As a result, salinity levels at all compliance and monitoring stations during January continued to remain low for the entire month. The salinity drop at S-21 on January 9<sup>th</sup> was possibly due to local creek runoff. In contrast, S-35 salinity drop on January 6<sup>th</sup> is probably due to a glitch in the data as a result of equipment malfunctioning temporarily.

### **Comparison of Reporting Period Conditions with Previous Years**

Monthly mean high-tide SC at the compliance and monitoring stations for January 2003 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations for January 2003 was similar to that of January 2002, with slightly differences in magnitude. Compared to previous nine years, January 2003 salinity levels were ranked third in low water quality.

**Table 1****Monthly Mean High Tide Specific Conductance at Suisun Marsh  
Water Quality Compliance Stations****January 2003**

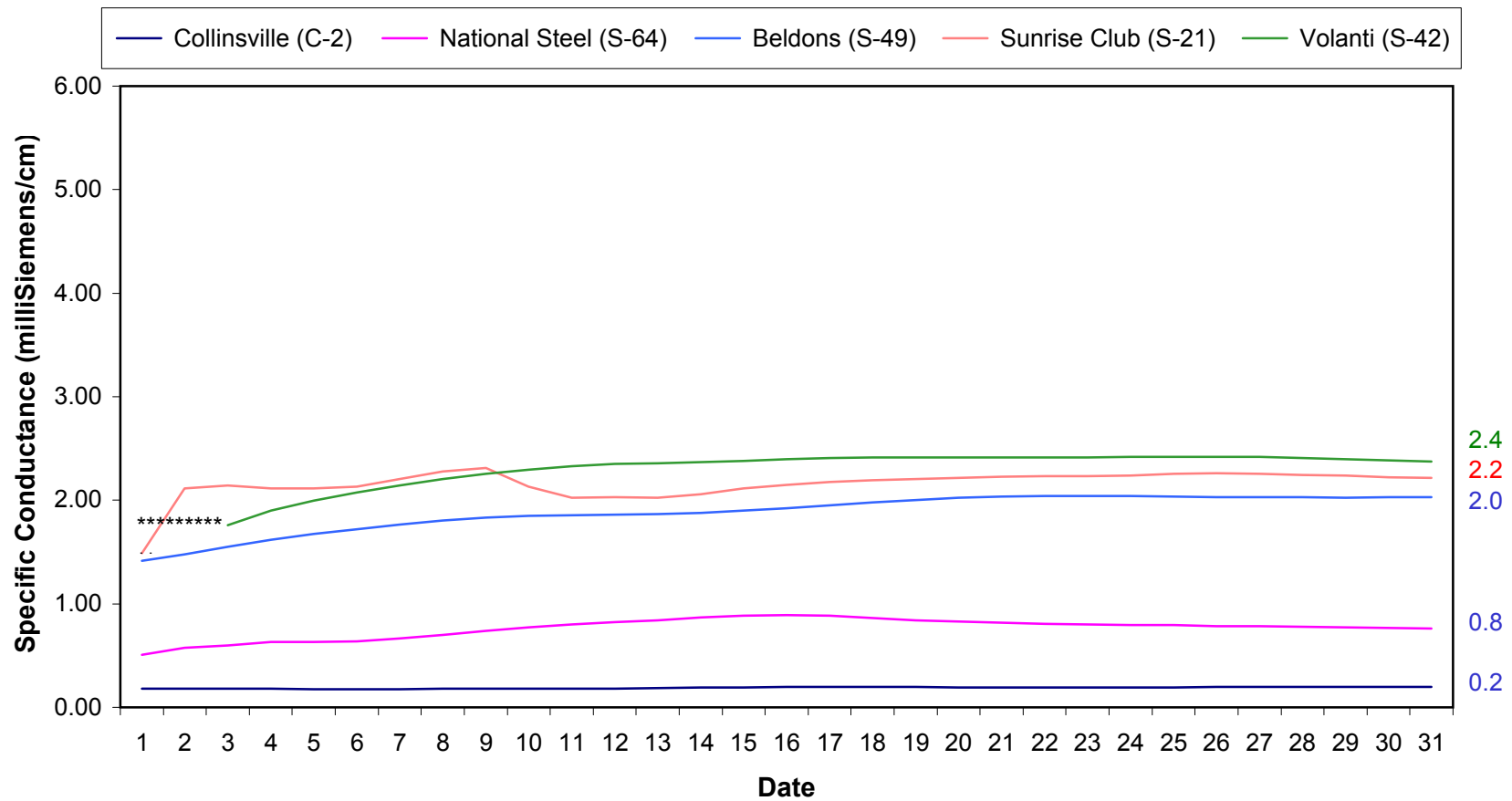
<b>Station</b>	<b>Specific Conductance (mS/cm)*</b>	<b>Standard</b>	<b>Standard meet?</b>
C-2**	0.2	12.5	Yes
S-64	0.8	12.5	Yes
S-49	2.0	12.5	Yes
S-42	2.4	12.5	Yes
S-21	2.2	12.5	Yes

\* = milliSiemens per centimeter

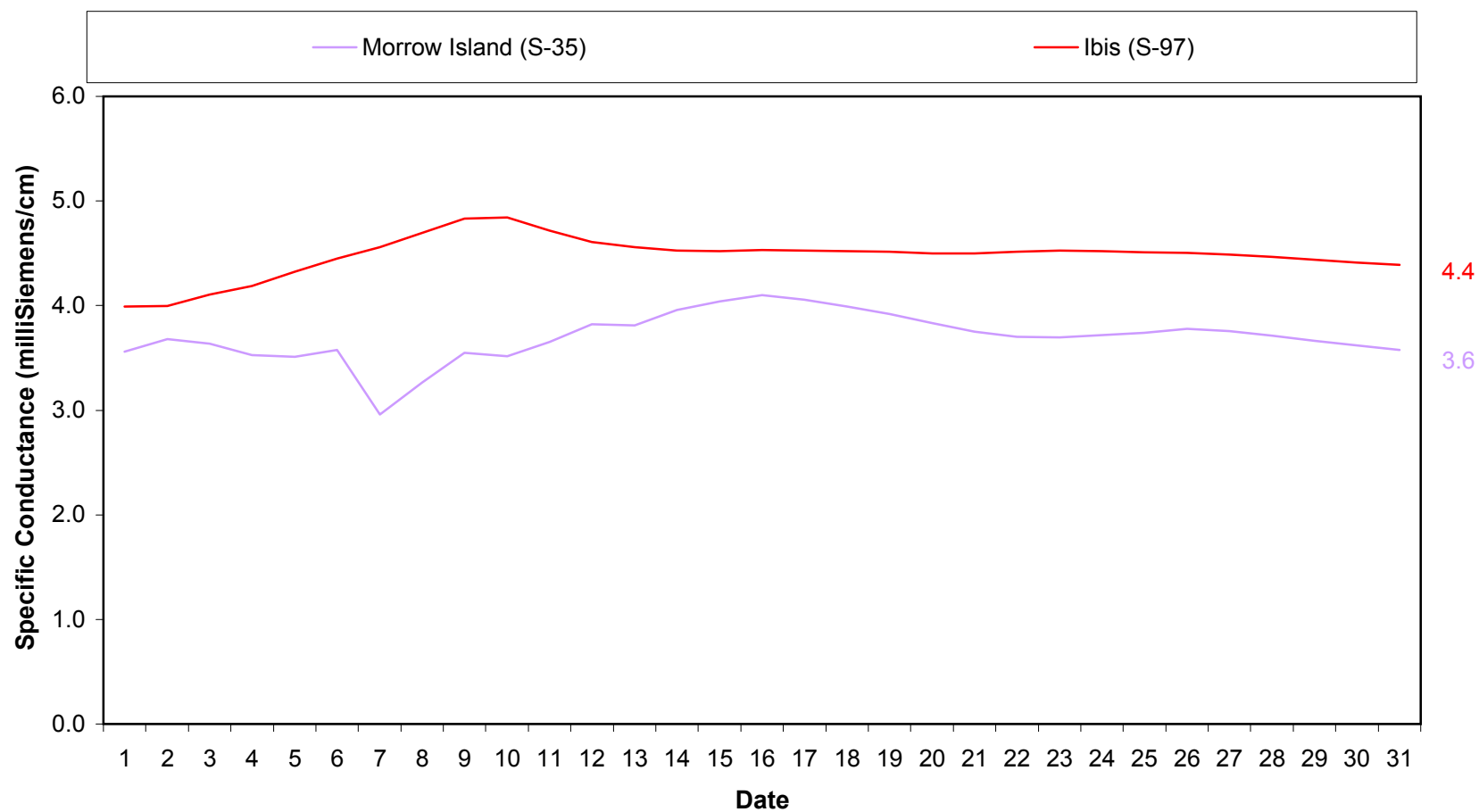
\*\*The representative data from nearby USBR station is used in lieu of data from station C-2.

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance  
January 2003**

Standard = 12.5 mS/cm

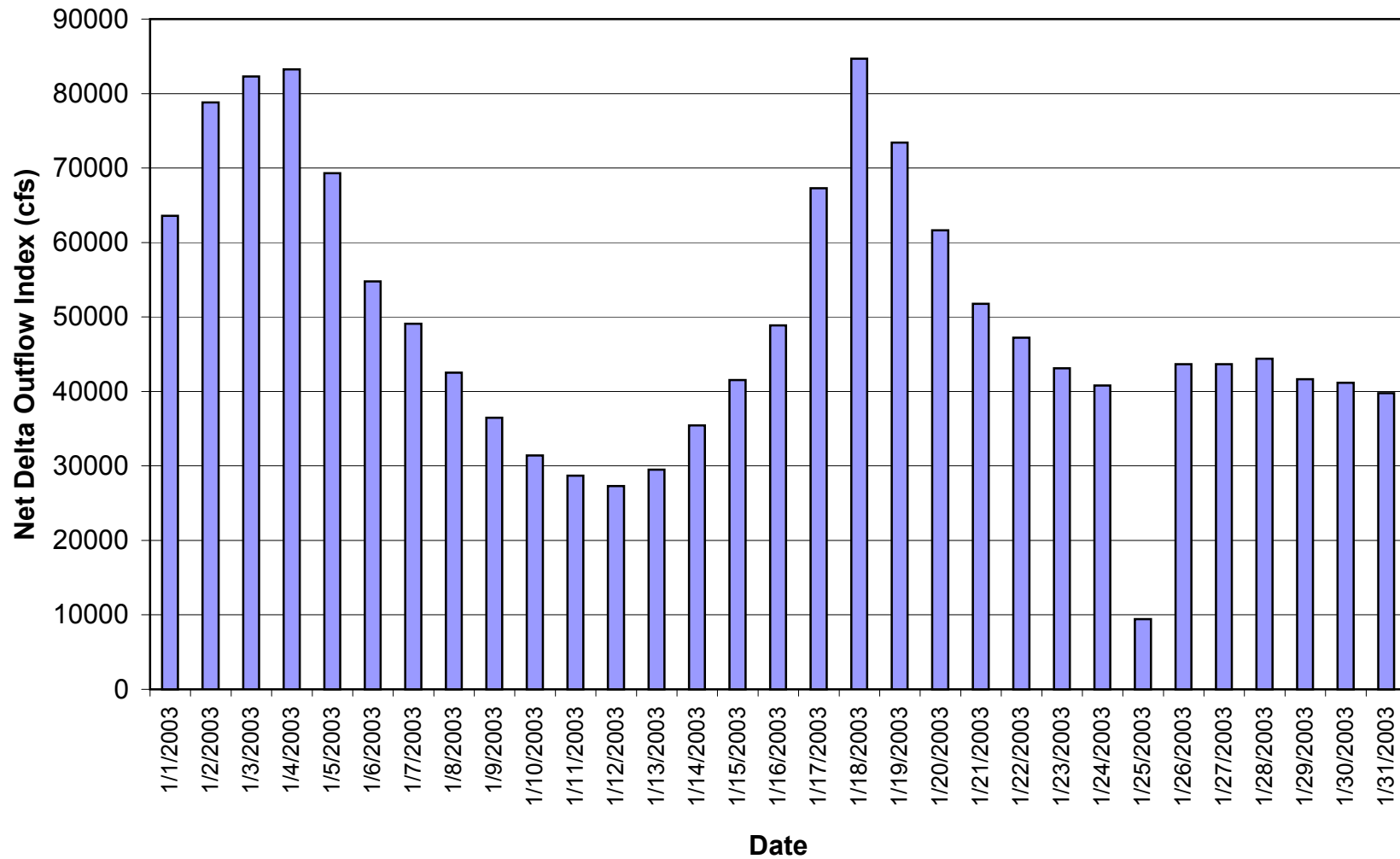


**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance  
January 2003**



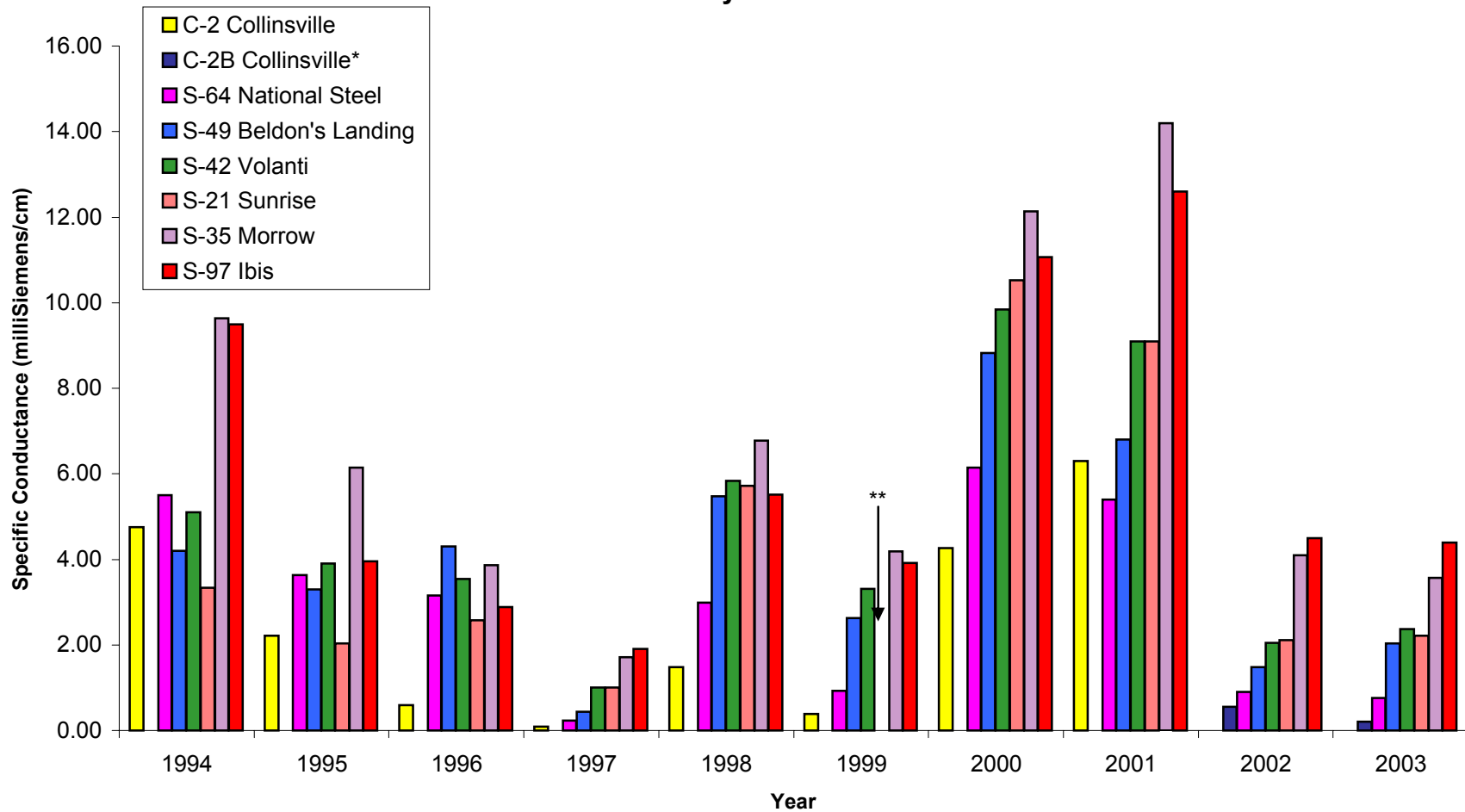


**Figure 3. Daily Net Delta Outflow Index For  
January 2003**



\*preliminary DWR, O&M data

**Figure 4. Monthly Mean Specific Conductance at High Tide:  
Comparison of Monthly Values for Selected Stations  
January 1994-2003**



\* = beginning in 2002.

\*\* Data was not obtained due to equipment problem.

Figure 5

